



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

VIA ELECTRONIC MAIL
DELIVERY RECEIPT REQUESTED

Mark Reznik
BioUrja Group
Mark.reznik@biourja.com

Re: Finding of Violation
BioUrja Group
Ethanol Manufacturing Facility
1 Edmund St.
Peoria, Illinois

Dear Mark Reznik:

The U.S. Environmental Protection Agency is issuing the enclosed Finding of Violation (FOV) to BioUrja Group (BioUrja or you) under Section 113(a) of the Clean Air Act (Act), 42 U.S.C. § 7413(a). We find that you are violating regulations promulgated under Section 111 of the Act, 42 U.S.C. § 7411, the New Source Performance Standards (NSPS), specifically, 40 C.F.R. Part 60, Subpart VV: Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemical Manufacturing Industry (NSPS Subpart VV); and regulations promulgated under Section 112 of the Act, 42 U.S.C. § 7412, the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories, specifically, 40 C.F.R. Part 63, Subpart FFFF: NESHAP for Miscellaneous Organic Chemical (MON) Manufacturing (NESHAP Subpart FFFF), and 40 C.F.R. Part 63, Subpart UU: NESHAP for Equipment Leaks – Control Level 2 Standards (NESHAP Subpart UU), at your Peoria, Illinois facility.

Section 113 of the Act gives us several enforcement options. These options include issuing an administrative compliance order, issuing an administrative penalty order and bringing a judicial civil or criminal action.

We are offering you an opportunity to confer with us about the violations alleged in the FOV. The conference will give you an opportunity to present information on the specific findings of violation, any efforts you have taken to comply and the steps you will take to prevent future violations. In addition, in order to make the conference more productive, we encourage you to submit to us information responsive to the FOV prior to the conference date.

Please plan for your facility's technical and management personnel to attend the conference to discuss compliance measures and commitments. You may have an attorney represent you at this conference.

The EPA contacts in this matter are Emma Leeds and Brianna Fenzl. You may email them at leeds.emma@epa.gov or fenzl.brianna@epa.gov to request a conference. You should make the request within 10 calendar days following receipt of this letter. We should hold any conference within 30 calendar days following receipt of this letter.

Sincerely,

Nathan Frank
Supervisor, Air Enforcement and Compliance Assurance Section (IL/IN)

Enclosure

cc: Kent Mohr, Manager
Compliance Section
Bureau of Air
Illinois Environmental Protection Agency
kent.mohr@illinois.gov

Subpart A) on August 17, 1971. *See* 36 Fed. Reg. 15704. EPA promulgated NSPS Subpart A on December 23, 1971. *See* 36 Fed. Reg. 24877. The subpart has been subsequently amended. NSPS Subpart A is codified at 40 C.F.R. §§ 60.1 – 60.19.

6. NSPS Subpart A at 40 C.F.R. § 60.11(d) requires that “at all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.”

NSPS for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry (SOCMI), 40 C.F.R. Part 60, Subpart VV

7. NSPS Subpart VV for Equipment Leaks of VOC (volatile organic compounds) in the Synthetic Organic Chemicals Manufacturing Industry applies to all affected facilities in the synthetic organic chemicals manufacturing industry that commenced construction, reconstruction, or modification after January 5, 1981, and before November 7, 2001. An affected facility is the group of all equipment within a process unit. “Equipment” includes each pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, valve, flange, or other connector in VOC service and any devices or systems required by Subpart VV. 40 C.F.R. §§ 60.480 and 60.481.

8. NSPS Subpart VV, at 40 C.F.R. §§ 60.482-1 through 60.482-10, establishes standards for all equipment. Each owner or operator must demonstrate compliance with these standards within 180 days of initial startup.

9. Specifically, 40 C.F.R. § 60.482-5(a) requires each sampling connection system to be equipped with a closed-purge, closed-loop, or closed-vent system, except as provided in 40 C.F.R. §§ 60.482-1(c) and 60.482-5(c).

10. Further, 40 C.F.R. § 60.482-6 requires that each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve, except as provided in 40 C.F.R. §§ 60.482-1(c) and 60.482-6(c) and (d).

11. NSPS Subpart VV, at 40 C.F.R. § 60.485(b)(1), requires the use of Method 21 of 40 C.F.R. Part 60, Appendix A, to determine the presence of leaking sources in order to determine compliance with the standards of 40 C.F.R. §§ 60.482-1 through 60.482-10, 60.483, and 60.484.

12. NSPS Subpart VV, at 40 C.F.R. § 60.482-2(a)(1), requires that each pump in light liquid service shall be monitored monthly to detect leaks using Method 21. 40 C.F.R. § 60.482-2(a)(2) requires that each pump in light liquid service be checked by visual inspection each calendar week.

13. NSPS Subpart VV, at 40 C.F.R. § 60.482-7(a)(1), requires that each valve in gas/vapor service and in light liquid service shall be monitored monthly using Method 21. Any valve for which a leak is not detected for 2 successive months may be monitored the first month of every quarter, beginning with the next quarter, until a leak is detected. 40 C.F.R. 60.482-7(c)(1)(i).

Section 112 of the Act, National Emission Standards for Hazardous Air Pollutants for Source Categories

14. Section 112(b) of the Act, 42 U.S.C. § 7412(b), lists 188 Hazardous Air Pollutants (HAPs) that cause adverse health or environmental effects.

15. Section 112(d)(1) of the Act, 42 U.S.C. § 7412(d)(1), requires EPA to promulgate regulations establishing emissions standards for each category or subcategory of major and area sources of HAPs that are listed for regulation pursuant to Section 112(c) of the Act, 42 U.S.C. § 7412(c).

16. Section 112(d)(2) of the Act, 42 U.S.C. § 7412(d)(2), requires that emission standards promulgated under Section 112(d)(1) of the Act require “the maximum degree of reduction in emissions of the hazardous air pollutants . . . that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies . . .” (hereinafter, “MACT”).

17. Section 112(h)(1) of the Act, 42 U.S.C. § 7412(h)(1), provides that if it is not feasible to prescribe or enforce an emission standard for control of a HAP, in lieu thereof EPA may promulgate a design, equipment, work practice, or operational standard, or combination thereof, consistent with the provisions of Section 112(d) of the Act, 42 U.S.C. § 7412(d).

18. Section 112(i)(3) of the Act, 42 U.S.C. § 7412(i)(3), provides that after the effective date of any emissions standard, limitation or regulation promulgated under Section 112 of the Act and applicable to a source, no person may operate such source in violation of such standard, limitation or regulation.

NESHAP for Source Categories, General Provisions, 40 C.F.R. Part 63, Subpart A

19. On March 16, 1994, U.S. EPA promulgated the General Provisions to Part 63 at 40 C.F.R. Part 63, Subpart A, §§ 63.1 - 63.16. *See* 59 Fed. Reg. 12408. The provisions have been subsequently amended.

20. 40 C.F.R. § 63.1(a)(4)(i) provides that each standard in 40 C.F.R. Part 63 “must identify explicitly whether each provision in this subpart A is or is not included in such relevant standard.”

21. 40 C.F.R. § 63.6(e)(1)(i) requires that “[a]t all times, including periods of startup, shutdown, and malfunction, the owner or operator must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions.”

NESHAP for Miscellaneous Organic Chemical (MON) Manufacturing, 40 C.F.R. Part 63, Subpart FFFF

22. NESHAP Subpart FFFF, for Miscellaneous Organic Chemical (MON) Manufacturing, applies to miscellaneous organic chemical manufacturing process units (MCPUs) that are located at, or a part of, a major source of HAP emissions, as defined in § 112(a) of the Act. 40 C.F.R. § 63.2435(a).

23. NESHAP Subpart FFFF, at 40 C.F.R. § 63.2480, requires the owner and operator of MCPUs to meet the requirements in Table 6 of the NESHAP Subpart FFFF for equipment leaks. Table 6 requires that for all equipment that is in organic HAP service and that is part of any MCU, the owner and operator must comply with the requirements of NESHAP Subpart UU, for Equipment Leaks – Control Level 2 Standards.

24. NESHAP Subpart FFFF, at 40 C.F.R. § 63.2450(c)(2)(i), requires the owner or operator of a combined stream consisting of emissions from Group 1 batch process vents and any other type of

emission stream to comply with the requirements of Table 2 to NESHAP Subpart FFFF and 40 C.F.R. § 63.2460 for Group 1 batch process vents, including applicable monitoring, recordkeeping, and reporting.

25. NESHAP Subpart FFFF, at Table 2.1.a, requires the owner or operator of Group 1 batch process vents to reduce collective uncontrolled organic HAP emissions from the sum of all batch process vents within the process by greater than or equal to 98 percent by weight by venting emissions from a sufficient number of the vents through one or more closed-vent systems to any combination of control devices (except a flare).

26. NESHAP Subpart FFFF, at Table 12, provides that 40 C.F.R. § 63.6(e)(1)(i) applies to Subpart FFFF until August 12, 2023.

NESHAP for Equipment Leaks – Control Level 2 Standards, 40 C.F.R. Part 63, Subpart UU

27. NESHAP Subpart UU, at 40 C.F.R. § 63.1019(a), provides that the provisions of Subpart UU apply to the control of air emissions from equipment leaks for which another subpart references the use of Subpart UU for such air emission control. The Subpart UU air emission standards for equipment leaks are set forth for administrative convenience and only apply to those owners and operators of facilities subject to a referencing subpart. The provisions of 40 C.F.R. Part 63, Subpart A, General Provisions, do not apply to Subpart UU, except as provided in the referencing subpart.

28. NESHAP Subpart UU, at 40 C.F.R. § 63.1023(b)(3), requires the detection instrument to be calibrated before use on each day of its use by the procedures specified in Method 21 of 40 C.F.R. Part 60 Appendix A.

29. NESHAP Subpart UU, at 40 C.F.R. § 63.1024(a), requires the owner or operator to repair each leak detected as soon as practical, but not later than 15 calendar days after it is detected, except as provided in paragraphs (d) and (e) of this section. A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.

30. NESHAP Subpart UU, at 40 C.F.R. § 63.1025(b)(1), requires valves to be monitored for leaks by the method specified in 40 C.F.R. § 63.1023(b) and, as applicable, 40 C.F.R. § 63.1023(c). The specific method for monitoring for valve leaks is Method 21 of 40 CFR Part 60, Appendix A.

31. NESHAP Subpart UU, at 40 C.F.R. § 63.1025(b)(2), states that for valves in gas and vapor service and in light liquid service, the instrument reading that defines a leak is 500 parts per million or greater.

32. For valves in gas and vapor service and in light liquid service, the NESHAP Subpart UU, at 40 C.F.R. §§ 63.1025(b)(3)(i) through(v), sets different monitoring frequencies dependent on the rate of leaking valves. For instance, if at least the greater of 2 valves or 2 percent of the valves in a process unit leak, the owner or operator shall monitor each valve once per month. Alternatively, at process units with less than the greater of 2 leaking valves or 2 percent leaking valves, the owner or operator shall monitor each valve once each quarter, except as provided in 40 C.F.R. §§ 63.1025(b)(3)(iii) through(v).

33. NESHAP Subpart UU, at 40 C.F.R. § 63.1026(b)(1), requires pumps to be monitored monthly for leaks by the method specified in 40 C.F.R. § 63.1023(b) and, as applicable, 40

C.F.R. § 63.1023(c). The specific method for monitoring for pumps leaks is Method 21 of 40 CFR Part 60, Appendix A.

34. NESHAP Subpart UU, at 40 C.F.R. §§ 63.1026(b)(2)(i) and (ii), states that for pumps in light liquid service, the instrument reading that defines a leak is 2,000 parts per million or greater for pumps in food/medical service, and 1,000 parts per million or greater for all other pumps.

35. NESHAP Subpart UU, at 40 C.F.R. § 63.1026(b)(4), requires each pump to be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.

Factual Background

36. BioUrja owns and operates an ethanol manufacturing plant at 1 Edmund Street, Peoria, Illinois 61602 (facility).

37. On November 1st, 2021, BioUrja purchased the facility from Vantage Corn Processors (Vantage), a wholly owned subsidiary of Archer Daniel Midlands Company (ADM).

38. ADM owned and operated the facility either directly, or through Vantage, its wholly owned subsidiary, from at least January 1, 2016, to the sale of the facility to BioUrja (ADM, Vantage, BioUrja, collectively, “the owner/operators”).

39. In the 2008 Notice of Compliance Status Report for NSPS Subpart FFFF Applicability, ADM determined that the yeast propagators and fermenters are subject to 40 C.F.R. Part 63, Subpart FFFF, because these MCPUs meet the definition of Group 1 Batch Process Vents. As per Table 6 to NESHAP Subpart FFFF, all equipment that is in organic HAP service and is part of any MCPU must comply with the equipment leak standards in 40 C.F.R. Part 63, Subpart UU.

40. The facility is subject to 40 C.F.R. Part 60 Subpart VV, because the facility is involved in the synthetic organic chemicals manufacturing industry and was constructed, reconstructed, or modified after January 5, 1981, and before November 7, 2006. 40 C.F.R. §§ 60.480(a) and (b).

41. EPA conducted an on-site unannounced Clean Air Act inspection of the facility on August 10, 2021 (2021 Inspection). Method 21 monitoring was performed by EPA at various parts of the facility, including but not limited to the Rectifiers 3 and 6, Fermenters 33, 39, 41, and 42, and Propagators 15 and 13.

42. EPA observed the following Method 21 readings during their Method 21 monitoring:

Tank	Component Type	Reading (parts per million methane)
Fermenter 39	Old sample port	1,050
Fermenter 41	Old sample port	820
Fermenter 41	Pressure relief valve (PRV)	1,950
Fermenter 42	Old sample port	1,980
Fermenter 42	PRV	3,200
Propagator 15	PRV	5,600

Propagator 15	Vacuum relief valve (VRV)	680
Propagator 13	PRV	620
Propagator 13	Connector	810

43. During the 2021 Inspection, ADM/Vantage informed EPA that emissions from the fermenters, propagators, and rectifiers are controlled by a regenerative thermal oxidizer.

44. During the 2021 Inspection, EPA observed VOC and/or HAP liquid process material on the facility floor, strong organic vapors, and background Method 21 readings in excess of 500 ppm. EPA read background VOC values up to 21,000 parts per million (ppm) while attempting to perform Method 21 monitoring on Rectifiers 3 and 6. ADM/Vantage had attempted to contain the process fluid in that area by placing sandbags around the floor beneath the sampling port.

45. During the 2021 Inspection, ADM/Vantage personnel informed EPA that the standard procedure for sampling is to purge the line to the floor, prior to collecting the sample, across the entire facility.

46. EPA observed six open ended lines without a cap, blind flange, plug, or a second valve while performing Method 21 monitoring at the facility.

47. On October 15, 2021, EPA provided the owner/operators with the inspection report for the 2021 inspection (the 2021 Inspection Report), which summarized and described compliance concerns identified during the 2021 inspection.

48. Following the inspection, EPA requested multiple records as well as follow up information from ADM/Vantage, including but not limited to regulatory reports, total fermenter PRV/VRV lift times, the NESHAP Subpart FFFF Notice of Compliance Status, and the MS Access version of the Leak Detection and Repair (LDAR) Guideware Database. ADM/Vantage provided the requested documents, excluding the MS Access version of the LDAR Guideware Database, on August 27, 2021 (August 2021 Review Documents).

49. The August 2021 Review Documents indicate that the facility has 79 sampling ports which are sampled anywhere from 1 to 4 times per day. One sampling port, NP 115, is sampled 0 times per day.

50. In December 2021, when EPA renewed its request to the facility to produce the Microsoft Access version of the LDAR Guideware Database, EPA was informed that ADM/Vantage had sold the facility to BioUrja, and the Guideware database remained in the possession of ADM/Vantage. BioUrja acquired the Microsoft Access version of the Guideware database from ADM/Vantage and provided it to EPA on January 27, 2022.

51. The Guideware database indicates on 446 occasions, the owner/operators did not calibrate the instrument before use on each day of its use for Method 21 monitoring.

52. The Guideware database indicates that the facility currently has 4881 valves and 132 pumps that are subject to the NSPS Subpart VV, as well as 114 valves and 5 pumps that are subject to the NESHAP Subpart UU.

53. From April 1, 2017, to the present, the owner/operators did not complete quarterly monitoring of all 4881 valves subject to the NSPS Subpart VV during at least 19 quarters, shown in the table below. EPA took into account the dates when valves were added to the LDAR system when performing these calculations.

Year	Quarter	Number of Missed Valves
2017	2	777
2017	3	347
2017	4	103
2018	1	163
2018	2	15
2018	3	14
2018	4	21
2019	1	14
2019	2	28
2019	3	200
2019	4	32
2020	1	214
2020	2	18
2020	3	367
2020	4	152
2021	1	221
2021	2	44
2021	3	139
2021	4	194

54. From April 1, 2017, to the present, the owner/operators did not complete monthly monitoring of all 132 pumps subject to the NSPS Subpart VV during at least 27 months, shown in the table below. EPA took into account the dates when pumps were added to the LDAR system when performing these calculations.

Month	Year	Number of Missed Pumps
May	2017	5
June	2017	5
July	2017	5
August	2017	5
September	2017	5
October	2017	1
February	2018	1
September	2019	1
February	2020	2
March	2020	6
April	2020	5
May	2020	4
June	2020	5
July	2020	3

August	2020	5
September	2020	5
October	2020	4
November	2020	4
December	2020	4
January	2021	4
February	2021	4
March	2021	5
June	2021	2
September	2021	4
October	2021	9
November	2021	4
December	2021	4

55. From April 1, 2017, to the present, the owner/operators did not complete weekly visual inspections of all 132 pumps subject to the NSPS Subpart VV during at least 101 weeks: 24 weeks in 2017; 1 week in 2018; 6 weeks in 2019; 43 weeks in 2020; 26 weeks in 2021; and at least 1 week in 2022.

56. From April 1, 2017, to the present, there was at least 1 occasion, in the second quarter of 2018, during which the owner/operators did not complete quarterly valve monitoring of all 114 valves subject to the NESHAP Subpart UU.

57. From April 1, 2017, to the present, the owner/operators did not complete monthly monitoring of all 5 pumps subject to the NESHAP Subpart UU during at least 43 months, shown in the table below.

Month	Year	Number of Missed Pumps
June	2018	2
July	2018	2
August	2018	2
September	2018	2
October	2018	2
November	2018	2
December	2018	2
January	2019	2
February	2019	2
March	2019	2
April	2019	2
May	2019	2
June	2019	2
July	2019	2
August	2019	2
September	2019	2
October	2019	2
November	2019	2

December	2019	2
January	2020	2
February	2020	2
March	2020	2
April	2020	2
May	2020	2
June	2020	2
July	2020	2
August	2020	2
September	2020	1
October	2020	3
November	2020	2
December	2020	2
January	2021	2
February	2021	2
March	2021	2
April	2021	2
May	2021	2
June	2021	2
July	2021	2
August	2021	2
September	2021	2
October	2021	2
November	2021	2
December	2021	2

58. From April 1, 2017, to the present, the owner/operators did not complete weekly visual inspections of the 5 pumps subject to the NESHAP Subpart UU during at least 175 weeks: 1 week in 2017; 31 weeks in 2018; 44 weeks in 2019; 49 weeks in 2020; 49 weeks in 2021; and at least 1 week in 2022.

59. From March 2017 to the present, there were at least 16 occasions during which the owner/operators did not make a first attempt at repair in 5 calendar days after the leak was detected, shown in the table below.

Tag Number	Date Monitored	Date Repair Attempt
STF-004	11/4/16	11/10/16
G3-120	11/16/16	11/29/16
R9-175	1/25/17	2/8/17
R9-197	1/25/17	2/8/17
G1-001	3/20/17	4/12/17
OTF-413	9/18/17	9/27/17
OTF-419	9/18/17	9/27/17
R6-029	10/16/17	10/26/17
R3-146	9/27/18	10/10/18
R9-110	10/31/18	11/8/18

R2-229	7/11/19	7/22/19
MS-204	1/29/20	2/5/20
OTF-447	6/8/20	6/18/20
G3-179	2/26/21	3/8/21
HN2-012	3/2/21	3/12/21
G2-103	5/27/21	6/9/21

60. On January 27, 2022, EPA conducted a conference call with BioUrja to review the equipment or operational changes made by BioUrja or the other owner/operators to address the compliance concerns identified in the 2021 Inspection Report, as well as any changes or modifications made to the facility since the 2021 Inspection. BioUrja stated that it had not implemented any changes or adjustments to the operations or equipment at the facility to address the compliance concerns identified in the 2021 Inspection Report.

Violations

61. By failing to equip each sampling connection system with a closed loop, closed vent, or closed purge, the facility violated and continues to violate NSPS Subpart VV, 40 C.F.R. § 60.482-5(a).

62. By purging VOC and/or HAP process fluid onto the floor and creating Method 21 background concentrations up to 21,000 ppm, which exceeds both the leak definitions in NSPS Subpart VV and in NESHAP Subpart FFFF, the facility created and continues to create conditions in which Method 21 cannot be performed properly on pumps or valves, thus violating NSPS Subpart VV, 40 C.F.R. §§ 60.482-2(a)(1), 60.482-7(a)(1), and NESHAP Subpart UU, 40 C.F.R. §§ 63.1025(b)(1) and 63.1026(b)(1).

63. By failing to place a cap, blind flange, plug, or second valve on open-ended valves or lines, the facility violated and continues to violate NSPS Subpart VV, 40 C.F.R. § 60.482-6.

64. By failing to capture and control all detectable emissions from fermenters and propagators identified in Paragraph 43 to the regenerative thermal oxidizer, the facility violated and continues to violate 40 C.F.R. § 63.2450(c)(2)(i) and Table 2 of NESHAP Subpart FFFF.

65. By failing to make a first attempt at repair in 5 calendar days after detecting leaks, the facility violated and continues to violate NESHAP Part UU, 40 C.F.R. § 63.1024.

66. By failing to complete quarterly monitoring of all valves subject to the NSPS Subpart VV, the facility violated and continues to violate 40 C.F.R. § 60.482-7(c)(1)(i).

67. By failing to complete monthly monitoring of all pumps subject to NSPS Subpart VV, the facility violated and continues to violate 40 C.F.R. § 60.482-2(a)(1).

68. By failing to complete weekly visual inspections of the pumps subject to the NSPS Subpart VV, the facility violated and continues to violate 40 C.F.R. § 60.482-2(a)(2).

69. By failing to calibrate the instrument of use on each day of use for Method 21 monitoring, the facility violated and continues to violate NESHAP Subpart UU, 40 C.F.R. § 63.1023(b)(3).

70. By failing to complete quarterly monitoring of all valves subject to NESHAP Subpart UU, the facility violated and continues to violate 40 C.F.R. § 63.1025(b)(3)(ii).

71. By failing to complete monthly monitoring on all pumps subject to NESHAP Subpart UU, the facility violated and continues to violate 40 C.F.R. § 63.1026(b)(1).

72. By failing to complete weekly visual inspections of all pumps subject to the NESHAP Subpart UU, the facility violated and continues to violate 40 C.F.R. § 63.1026(b)(4).

73. The noncompliance described above are also violations of the applicable Good Air Pollution Control Practice provisions of the General Provisions of the NSPS and NESHAP, as set forth at 40 C.F.R. § 60.11(d) and 40 C.F.R. § 63.6(e)(1)(i), respectively.

74. The regulatory violations described above are also violations of Sections 111(e) and 112(i)(3) of the Act, 42 U.S.C. §§ 7411(e) and 7412(i)(3).

Environmental Impact of Violations

75. These violations have caused or can cause excess emissions of VOCs.

76. VOCs are photochemical oxidants associated with a number of detrimental health effects, which include birth defects and cancer, as well as environmental and ecological effects. In the presence of sunlight, VOCs are influenced by a variety of meteorological conditions and have the ability to create photochemical smog. VOCs react with oxygen in the air to produce ground-level ozone.

77. Breathing ozone contributes to a variety of health problems including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level ozone also can reduce lung function and inflame lung tissue. Repeated exposure may permanently scar lung tissue.

Michael D. Harris
Division Director
Enforcement and Compliance Assurance Division